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(71) Applicant (for all designated States except US):  
TEI-AVIV UNIVERSITY FUTURE TECHNOLOGY DEVELOPMENT L.P. [IL/IL]; P.O. Box 39040, 69978 Tel-Aviv (IL).

(72) Inventors; and

(75) Inventors/Applicants (for US only): NATHAN, Menachem [IL/IL]; 5 Arie Suslik Street, Tel Aviv 69359 (IL).

PELED, Emanuel [IL/IL]; 25 Hanote'a Street, 40500 Even Yehuda (IL). GOLODNITSKY, Diana [IL/IL]; 16/6 Hanagid Street, 75482 Rishon Lezion (IL). YUFIT, Vladimir [IL/IL]; 14/19 Michashvili Street, 77535 Ashdod (IL).

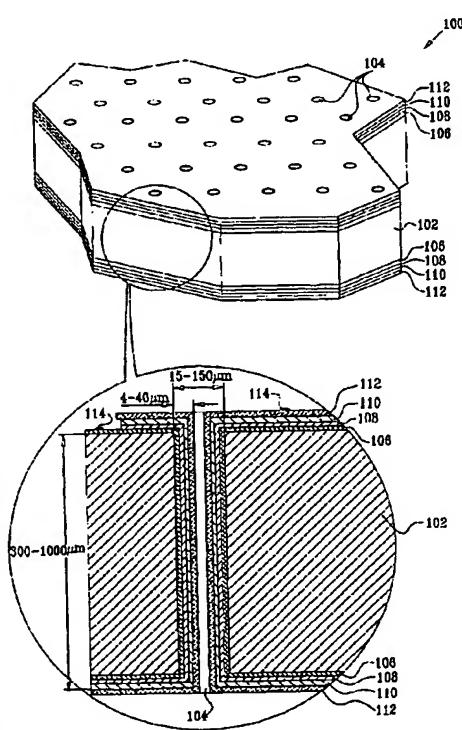
(74) Agents: SANFORD T. COLB & CO. et al.; P.O. Box 2273, 76122 Rehovot (IL).

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*[Continued on next page]*

(54) Title: THIN-FILM CATHODE FOR 3-DIMENSIONAL MICROBATTERY AND METHOD FOR PREPARING SUCH CATHODE



(57) Abstract: A method for producing a microbattery (100) including providing a conductive substrate (102), forming a thin film cathodic layer (108) on at least one surface of the conductive substrate, subsequently forming a thin film electrolyte layer (110) over the cathodic layer and subsequently forming a thin film anodic layer (112) over the electrolyte layer.

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# INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER  
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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 H01M C25D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 550 015 A (RECH APPLIC ELECTROCHIMIQUE) 1 February 1985 (1985-02-01)	1-3, 7-12,14, 15, 19-24, 26-28, 32-37, 39,40, 44-49
Y	page 2, line 11 - page 3, line 8  claims 9,10	4-6,13, 16-18, 25, 29-31, 38, 41-43,50  -/-

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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Name and mailing address of the ISA  
European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Standaert, F

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 197 450 B1 (PELED EMANUEL ET AL) 6 March 2001 (2001-03-06) cited in the application column 2, line 26 - line 58 column 3, line 29 - line 40 column 4, line 36 - line 39 -----	1-50
Y	EP 0 450 848 A (GOULD INC) 9 October 1991 (1991-10-09)  page 2, line 8 - line 13 page 3, line 40 - line 57 -----	4-6, 13, 16-18, 25, 29-31, 38, 41-43, 50
A	ALBU-YARON A ET AL: "Influence of the electrochemical deposition parameters on the microstructure of MoS <sub>2</sub> thin films" THIN SOLID FILMS, ELSEVIER-SEQUOIA S.A. LAUSANNE, CH, vol. 361-362, no. 1, February 2000 (2000-02), pages 223-228, XP004187475 ISSN: 0040-6090 cited in the application page 223, left-hand column, line 1 - right-hand column, line 21 -----	13, 25, 38, 50
A	EP 1 134 821 A (TOKYO INST TECH) 19 September 2001 (2001-09-19) paragraphs '0002! - '0011! -----	1-50

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/IL 03/00623

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 2550015	A	01-02-1985	FR 2550015 A1	01-02-1985
US 6197450	B1	06-03-2001	AT 224587 T AU 6119499 A DE 69903073 D1 DE 69903073 T2 EP 1145348 A1 WO 0025378 A1	15-10-2002 15-05-2000 24-10-2002 15-05-2003 17-10-2001 04-05-2000
EP 0450848	A	09-10-1991	US 5041199 A AT 124808 T CA 2038094 A1 DE 69110941 D1 DE 69110941 T2 EP 0450848 A2 JP 5094821 A	20-08-1991 15-07-1995 05-10-1991 10-08-1995 23-11-1995 09-10-1991 16-04-1993
EP 1134821	A	19-09-2001	JP 3353070 B2 JP 2001329395 A EP 1134821 A1 US 2003155251 A1 US 2001052463 A1	03-12-2002 27-11-2001 19-09-2001 21-08-2003 20-12-2001